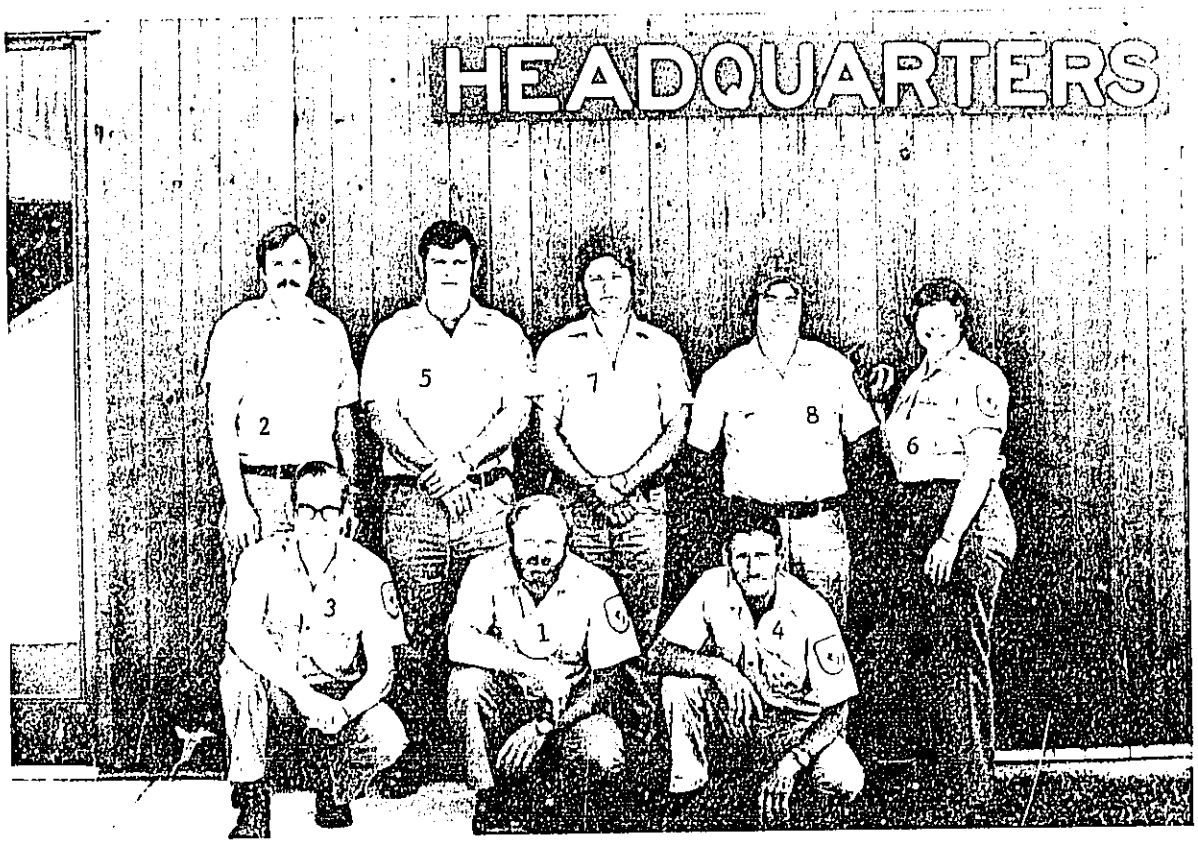
1981

SWAN LAKE NATIONAL WILDLIFE REFUGE
Sumner, Missouri

ANNUAL NARRATIVE REPORT
Calendar Year 1981

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM



Personnel

		EOD
1.	John E. Toll, Refuge Manager, GS-485-12, PFT	06-06-81
2.	Jerry D. Kuykendall, Asst.Refuge Mgr., GS-485-9,PFT	01-19-78
3.	Edward R. Moyer, Outdoor Rec. Plan., GS-023-5, PFT	06-19-78
4.	Bennie M. Hull, Bio.Tech., GS-404-7, PFT	08-02-65
5.	Harold C. Milligan, Tractor Oper.,WG-5705-6, PFT	05-14-75
6.	Janis A. Manke, Refuge Asst., GS-303-5, CS	07-19-76
7.	Stuart L. Burnside, Trac.Oper., WG-5705-6, FT subject to furlough	04-07-72 - 10-04-81 (furloughed)
8.	Irvy L. Miller, Trac.Oper., WG-5705-5, FT subject to furlough	03-23-53 - 10-04-81 (furloughed)

Review and Approvals

John E. Toll 2/26/82
Submitted by Date

Ronald L. Young 3/5/82
Area Office Review Date

Regional Office Review Date

TABLE OF CONTENTS

Page

G. WILDLIFE

H. PUBLIC USE

Page

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

A. HIGHLIGHTS

Refuge Manager Al Manke retired. (Section E.1)

The intensive farming operation has been modified to include moist soil plant manage:t. (Section D.2)

Several BLHP projects were started or completed this year. (Sections E.5 and I.1 and I.2)

John E. Toll transferred from Horicon NWR to become manager at Swan Lake NWR. (Section E.1)

Intensive flooding ruined crop production this year. (Sections B and F.2)

Refuge Open House extended. (Section H.1)

Record visitation for Eagle Days. (Section H.7A)

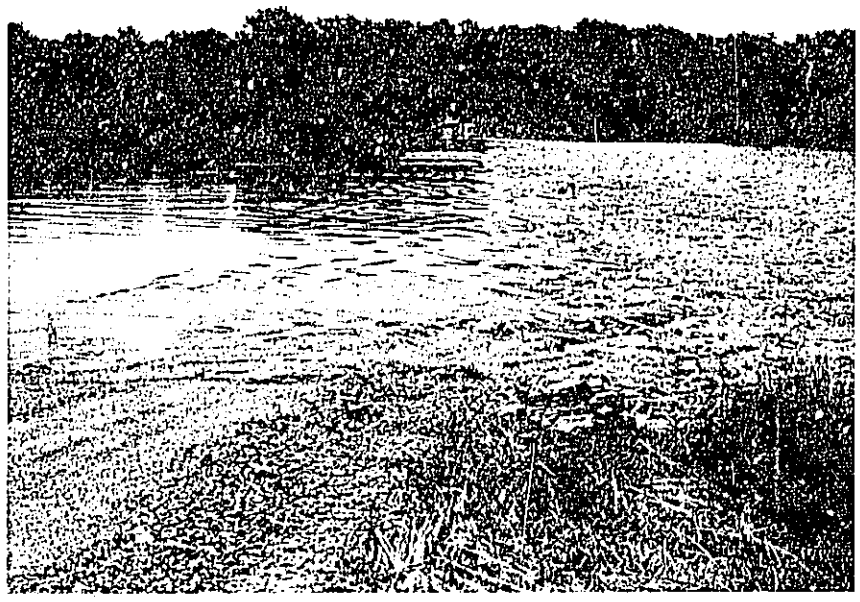
B. CLIMATIC CONDITIONS

We entered 1981 in a mild, dry winter with little snowfall. By March, the lakes were 30" below normal capacity and there was no appreciable subsoil moisture. On April 12, the drought was broken with .4" moisture and total rainfall for that month was about 2". Yet, the pools were still about 2' below normal capacity.

It rained 19 days in May and Silver Lake rose 42" in five days. This precipitation stimulated excellent vegetative growth which provided good nesting cover. June received 8.75" of rain, .03" more than May, but spaced so that it kept the refuge fields too wet to work. Routine maintenance became too routine for our two extra tractor operators.

By July, it was apparent that our biofarming program was in trouble for the year but the fields dried enough in the middle of the month to work a week planting short season milo. Then it rained 3" on July 20, another 3" on the 23rd and continued to rain for the next five days. The refuge began flooding on July 26 and was about 85% under water by the 29th when floodwaters were lapping on each side of the main entrance levee and our newly constructed Dike A was cut in four places. The State-maintained patrol road to public goose blinds on the southern perimeter washed out in several places. Parts of that road had not been cut in more than 20 years.

August was great for shorebirds in the mud flats of refuge fields and smartweed production was excellent. Total grain production from the refuge biofarming program came from only 250 acres of late milo. Our first frost occurred on September 16, 25 days ahead of the normal October 10 date. September and October were both cool and dry, and the weather was beautiful.



#1 - Flooding on Silver Lake Levee 81-GI/1208 ERH

#2 - More Flood Waters 81-GI/1209 ERH

November returned to normal...wet again! Flooding from Yellow Creek on the southern boundary from the 2nd-7th closed 21 goose blinds for five days. Much of the smartweed became available for ducks, though; and an estimated 25,000 mallards concentrated on the refuge. The year ended cold and white with about a foot of snow falling in December. Since there was little grain on the refuge, our wintering EPP Canada geese were forced to disperse more than usual. Thus the peak number of bald eagles on the refuge dropped 50% from last year and down considerably from the record high of 181 in 1979. Only 82 eagles were contemplating Christmas goose when counted on the 21st.

D. PLANNING

2. Management Plan

For the past 30 years there has been an increasing emphasis on farming for geese on the refuge. To date there are 3100 acres of land that until three years ago were planted to corn, wheat or milo. For the past three years there has been an attempt to place 1900 acres of this total into an organic farm program. This program calls for a four-year rotation which would be a sound organic farming practice on normal farming ground. However, most of the farm land on the refuge is subject to flooding. The land can be divided into three groups; land that floods four out of five years, land that floods two out of five years, and land that floods one out of five years. The same type of land management, i.e. farming, cannot be applied to all land. Therefore, we will manage the 600+ acres of land that floods four out of five years for moist soil plants. The remainder of the land will continue to be organically farmed.

The organic farm program was also modified this year. Previously the crop rotation was the first year corn, then milo, followed by winter wheat, and concluding the cycle was clover. We altered this rotation to first corn, then clover, followed by milo, then soybeans which are plowed down in August for green manure and completing the cycle, winter wheat is sown on the bean ground for browse. We are more comfortable with the rotation because it breaks up the corn-milo cycle and it offers us two years of legumes for nitrogen fixation.

3. Public Participation

Several civic organizations were given programs outlining a new approach to farming and changes in fishing regulations. No negative feedback developed.

4. Compliance with Environmental Mandates

An environmental assessment was prepared addressing the impact of rehabilitating 1.6 miles of levees and four water control structures, build six access ramps for farm equipment, and gravel 2.7 miles of secondary roads.

Another assessment was written concerning the conversion of 600 acres of croplands to moist soil plant management.

Archaeological surveys were accomplished for the above projects with no significant artifacts discovered.

E. ADMINISTRATION

1. Personnel

Refuge Manager Alfred O. Manke retired January 9, after 34 years of Federal service. Jack Toll transferred from Horicon NWR c June 6, to become project leader.

	Permanent		
	Full-Time	Part-Time	Temporary
FY-81	5	3	
FY-80	5	3	
FY-79	5	3	
FY-78	5	3	
FY-77	4	3	

2. Youth Programs

There were two YACC enrollees on board most of the year. They have been a real asset to our maintenance program.

5. Funding

During 1981, BLHP had a great impact on the refuge. There were four BLHP projects either completed or started. The Administrative Office/ Visitor Contact Station, BLHP #14-16-0006-80-054 was completed in January at a final cost of $302,918. Project #14-16-0006-80-143, Construction of Cropland Protection Levees continued throughout 1981, and will not be completed until 1982. Total dollars for this contract are $374,450. A third contract, #14-16-0003-81-139 was let for $203,555. This work includes levee repair and water control structure replacement. The last project for 1981 was BLHP #14-16-0003-81-116, let for $220,000, to repair Levee 1.

	Planning Allowance:				
	1977	1978	1979	1980	1981
Subactivity					
1110	0	400	300	0	0
1210	127,650	139,000	179,000	182,000	193,000
Rehab	53,000	0	0	0	8,000
1220	1,000	1,000	0	0	2,000
1230	1,000	1,000	1,500	0	0
1240	26,200	31,700	35,000	38,000	29,000
1400	300	0	0	0	0
Total	$209,150	$173,100	$215,800	$220,000	$232,000

Funding has remained adequate to carry on the refuge programs. BLHP and rehab monies have given the refuge an opportunity to upgrade or repair facilities and equipment.

6. Safety

No lost time accidents occurred this year. It has been 6078 days since this station experienced a lost time accident.

A multitude of topics were discussed at the monthly safety meetings. Numerous safety films were also seen.

A safety committee was formed and each staff member is required to present at least one monthly safety meeting.

Vehicle safety inspections were accomplished every 3000 miles or 90 days.

F. HABITAT MANAGEMENT

1. General

Swan Lake National Wildlife Refuge is located in the floodplain of the Grand River near its confluence with the Missouri River. This is rolling country with many small streams, resulting in rapid runoff, except in the flat floodplains of the larger rivers which are subject to flooding. Accordingly, as discussed in climatic conditions, the refuge was inundated several times this year. As a result, our farming and wetland management was severely affected.

2. Wetlands

Wetland management has consisted of spring draw downs in Swan Lake and South Pool to produce moist soil foods and flooding them in the fall for waterfowl use. Millet and smartweed production in Swan Lake has declined because of dense stands of bulrush. In 1980, because of the drought, the lake went dry, allowing us to mow and burn 300 acres of bulrush. The results were good as these areas produced excellent stands of millet and smartweed, but we also noticed sprigs of bulrush. It appears that high water this year has completed the job as there is virtually no bulrush in Swan Lake. It is our observation that mowing or disking is not necessary to control bulrush if you can completely submerge the plant during the growing season.

Because of flooding there were no drawdowns or moist soil food production in the pools. But many of the bottomland farm fields that were too wet to farm produced tremendous stands of millet and smartweed. These fields were flooded in the fall from heavy rains and amply used by waterfowl. Many of these fields are now being deleted from our farm program and turned into moist soil plant production.

4. Croplands

In the cropland section of the 1980 narrative it was reported "because of the hot, dry conditions it was not possible to measure the effects of organic farming. Hopefully, 1981 will be a more prosperous year". Well, 1981 was as wet as 1980 was dry. Our farm program, in regards to row crop and green manure production, was a wipeout.

As reported in Management Plan the four year rotation has changed. The first year is corn, then clover, followed by milo, and concluding the cycle is soybeans, which are plowed down in August and winter wheat is then planted for browse. Our intentions are to plant 450 acres of clover, 450 acres of corn, 450 acres of milo, and 450 acres of soybeans/winter wheat.

The farming operation began in March with the aerial seeding of 450 acres of clover. A mixture of 80% sweet and 20% alsike was used at a rate of 20 pounds per acre. We have discovered our seeding rate was too high and in 1982 we will only seed 10 pounds per acre. Results were very good in all fields until June when floods destroyed all but 157 acres.

Drought conditions carried over from 1980 into the spring of 1981. So, we decided to plant all milo. Immediately after purchasing the seed it began to rain and did not stop. Of course, it made little difference what we planted as neither corn nor milo grows well as a submergent.

The farming operation was an on-again off-again proposition. We started the tillage operation in March and by the end of the month had chisel plowed 600 acres. The land was ready to plant but it was too early to plant milo. So we waited the entire month of April intending to resume operations in May. Unfortunately, it rained throughout May and the fields were too wet to work. We returned to farming the second week in June and planted 120 acres on the 19th. It then began to rain. Three weeks later, on July 9, we started farming again and in the next few days managed to plant 280 acres. Only 404 acres of the intended 900 acres were planted and of the 404 acres, 260 acres were destroyed by flooding or did not mature because of late planting. The milo that did make yielded an estimated 65 bushels per acre.

We planted 310 acres of winter wheat for goose browse.

In 1980, we could not report on results of organic farming because our crops were destroyed by drought; and in 1981, we will not be able to report on the effects of organic farming because of flooding. Well, there is always next year.

The Missouri Department of Conservation planted 250 acres of Japanese millet, 400 acres of winter wheat, 100 acres of sweet clover and 6.3 acres of German millet in the public hunting area on the refuge.

#4 - Sweet-Alsike clover SI-CI/1206 ERM

#5 - Mowing the clover SI-CI/1205 ERM

5. Grasslands

Approximately 300 acres of grasslands are managed to produce goose browse and goose loafing sites. Another 300 acres are managed for native grasses and associated fauna.

Management of the native grasses is by prescribed burning.

9. Fire Management

Approximately 300 acres of native grasses are prescribed burned every three years. It is a simple operation utilizing permanent firebreaks. There are no wildfire problems on this refuge.

12. Wilderness and Special Areas

About 1000 acres of bottomland timber have been designated as a Research Natural Area.

G. WILDLIFE

1. Wildlife Diversity

One affect of converting over 600 acres of cropland into moist soil plant production is increased wildlife diversity. One study showed 86 species of birds utilizing a moist soil unit as compared to 14 species using a cornfield. Also, to enhance wildlife diversity we have discontinued mowing roadsides, W-ditches, and farm field borders. We plan on allowing these areas to revert to old field succession.

2. Endangered and/or Threatened Species

The bald eagle and the peregrine falcon are the only nationally listed endangered species found on this refuge. Eagles are quite common in their occumence here, but the falcons are rare.

Bald eagles use this refuge for feeding, loafing and roosting. They begin arriving in October, peak in December-January, and fly north in March.

This year the bald eagle population peaked in December at 82. In 1980, the peak eagle population was 139 and in 1979, the peak was 181. This decline is attributed to a decline in the goose-use on the refuge. Our records and observations show that eagle use-days on the area are directly proportional to waterfowl use-days.

There were no sightings of peregrine falcons this year.

The following wildlife found on this refuge are on Missouri's Endangered Species List: Marsh hawk, sharp-shinned hawk, Cooper's hawk, King rail, upland sandpiper, least tern, osprey, smooth green snake, and long tailed weasel.

3. Waterfowl

As usual, it was not a "normal" year for the Eastern Prairie Population of Canada geese. Peak fall populations on the refuge were down to 88,000, compared to a peak of 120,000 in 1980. There are a myriad of variables affecting this decline; poor production, dispersion making the census difficult, and problems with the harvest survey method that is being used.

The snow/blue goose population peaked at 20,000 in November. A decline from the peak of 50,000 in October of 1980.

Fall duck populations were normal. For example, in October there were:

mallard	25,000	wood duck	1,000
gadwall	1,000	ring-neck	1,000
pintail	1,000	canvasback	1,000
green-winged teal	1,000	scaup	1,000
blue-winged teal	1,000	bufflehead	500
American widgeon	1,000	ruddy	500
shoveler	1,000		

4. Marsh and Water Birds

During the spring, summer, and fall, a diversity of marsh and water birds could be observed throughout the refuge. Species frequently encountered were white pelicans. American bitterns, great blue herons, pied billed grebes, great egrets, and cattle egrets. Also observed, but less common were black-crowned night herons, yellow-crowned night herons, green herons, and double-crested cormorants.

Numerous white pelicans were seen this fall. On September 30, 2500 pelicans were counted on Swan Lake.

5. Shorebirds, Gulls, Terns, and Allied Species

Common species are greater yellowlegs, killdeer, black terns, common snipe, ring-billed gull, Bonaparte's gull, and several sandpiper species.

6. Raptors

Raptor populations are quite high, particularly during periods of waterfowl concentrations. Marsh, rough-legged, and red-tailed hawks are the most numerous with peaks of 25, 50, and 50, respectively.

#5 - Everything is ducky!?

81-AZa/1195 ERM

7. Other Migratory Birds

The mourning dove population peaked at 5000 in August. Large flocks of grackles and red-winged blackbirds are common in the fall, with numbers estimated at 1,000,000.

8. Game Mammals

White-tailed deer, cottontail rabbits, squirrels, and raccoons are classified as game mammals in Missouri, all of which occur in abundance on this refuge.

During the late fall and early winter the deer herd increases to a peak population of 600.

The squirrel, rabbit, and raccoon populations were excellent this year.

10. Other Resident Wildlife

Muskrat populations appear to have declined in response to our removal of 300 acres of bulrush from Swan Lake. Beaver activity is abundant in all of the lakes and creeks. There is a small flock of turkeys, 25 in all, frequently seen in the Yellow Creek area. The quail population is estimated at 250 birds.

15. Animal Control

Several depredation complaints concerning Canada geese on winter wheat were received and scare-away guns were loaned to the complainants during the month of February.

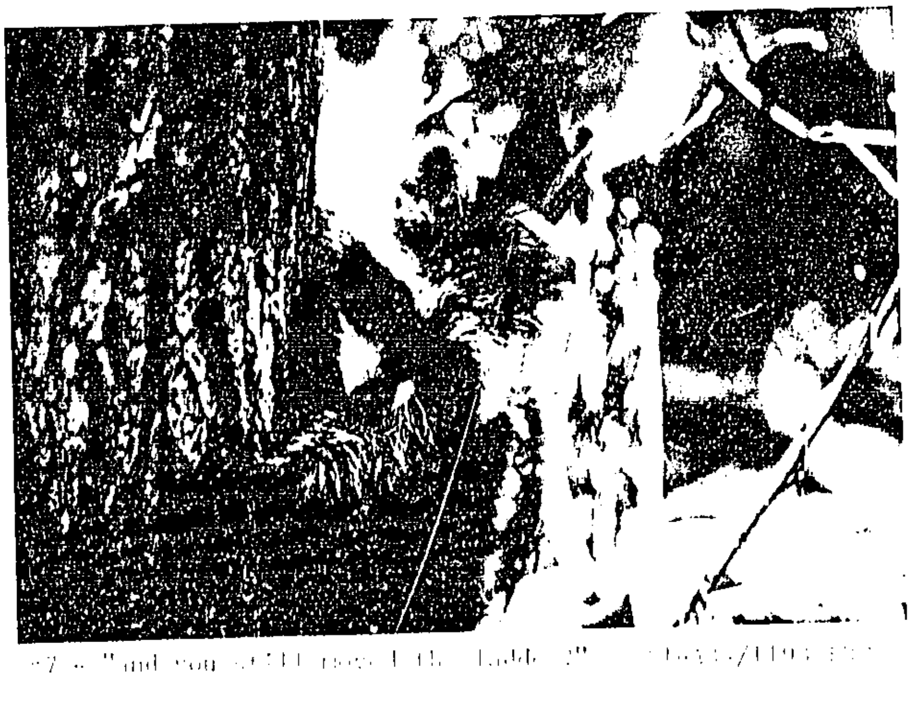
Locally we have very few problems with depredations as most of the area farmers have been educated to handle the problems thenselves.

16. Marking and Banding

Banding quotas for pre-season and post-season called for 500 immatures to be banded or 2000 Canada geese total, whichever came first. Pre-season and post-season quotas were met. Blood samples were taken from 400 geese during post season banding for lead residue analysis. The samples were shipped to the National Wildlife Health Lab but as of yet they have not been analyzed.

This year we also had a wood duck banding quota of 25 ducks of each age and sex. Approximately 80% of the refuge was flooded during July, preventing any duck trapping.

#6 - "He talked my ear off!"
[illegible]-A3a/119a ERM



#7 - "and you [illegible]" [illegible]

H. PUBLIC USE

1. General

"Open House", the primary public use event of years past, was traditionally held on the Sunday immediately prior to goose hunting. This event was always popular, but large crowds (more than 11,000 in 1978) decreased the opportunity to view wildlife. After the first few vehicles traveled through the refuge, more visitors saw clouds of dust than wildlife.

This year Open House was extended to two weekends; October 17-18, and October 24-25. Despite this extended period, less than 7000 visitors took advantage of the opportunity and only 947 people walked into our new Visitor Contact Station. Special Open House interpretive auto tour leaflets were not printed this year.

2. Outdoor Classrooms - Students

We had more than twice as many students participating in outdoor classroom activities during the year than in 1980. However, 257 students are not an overly impressive total.

Approaches used at Swan Lake National Wildlife Refuge depend greatly upon the students age, but initially they are divided into groups of a manageable size. Ideally (the ideal doesn't often happen) there should be one motivated teacher for every 10 students. Five is better yet. If they've been on the road for 45 minutes or longer and time allows, a trip up the "tower" is the first activity. It has nothing to do with environmental education but is both a convenient way to orient students to the refuge and a release for pent up energy. Sometimes, a bus load of kids resembles a box of coiled springs.

Next, we involve all of the students in role playing and multi-sensory approaches to refuge resources. Facts are not nearly as important as concepts.

An activity borrowed heavily from Van Matre's "One Cubic Foot of Soil" acclimatization activity is used effectively here. Missouri has the nation's second highest soil erosion loss after Tennessee, and most of our students are from rural areas and farms. This activity is valid, immediate, and fun.

Younger students appreciate "stories". To wrap up a soils investigation and tie it all into a greater whole, a reading was selected from the Lakota's Chief Standing Bear (Touch the Earth compiled by T.C. McLuhan, p.6). The teachers are encouraged to go slowly and to be a participant as well as a leader. Effective teaching hinges upon enthusiasm.

In 1981, we helped field test an activity from the Service's Outdoor Classrooms Habitat Pac 5 (Farms,Ranches, & Wildlife) entitled "Diversity--the Key to Life". Some of the students seemed to think their grade was going to be based upon their ability to identify and list all of the

#8 - Discovery occurs at all levels along the Habitat Trail

#9 - Puffballs, diversity under foot

plants and animals encountered in each of the three different habitat types. They and their teachers were intimidated. Inspite of this, the exercise was valuable because it encouraged students to look at various habitats from a wildlife perspective and that may have been a "first" for many of them.

3. Outdoor Classrooms - Teachers

Since 1980, this refuge has been a destination for a Teacher's Mobile Workshop organized by the Missouri Department of Conservation. Due to insufficient enrollment, this was canceled in 1981. The refuge had eleven teachers involved in Outdoor Classroom activities according to the Service definition in 1981. A half-dozen of these share a definite commitment to environmental education and four agreed to review some of our Habitat/Issue Packages.

Much of I&R is like preaching to the saved. It is a pity that the one thing which the Service was doing to modify attitudes when they are being formed was among the first to be cut as funding became tight. Environmental literacy is not a four-year problem. Achieving it will take a generation or more of focused effort involving both teachers and their students.

4. Interpretive Foot Trails

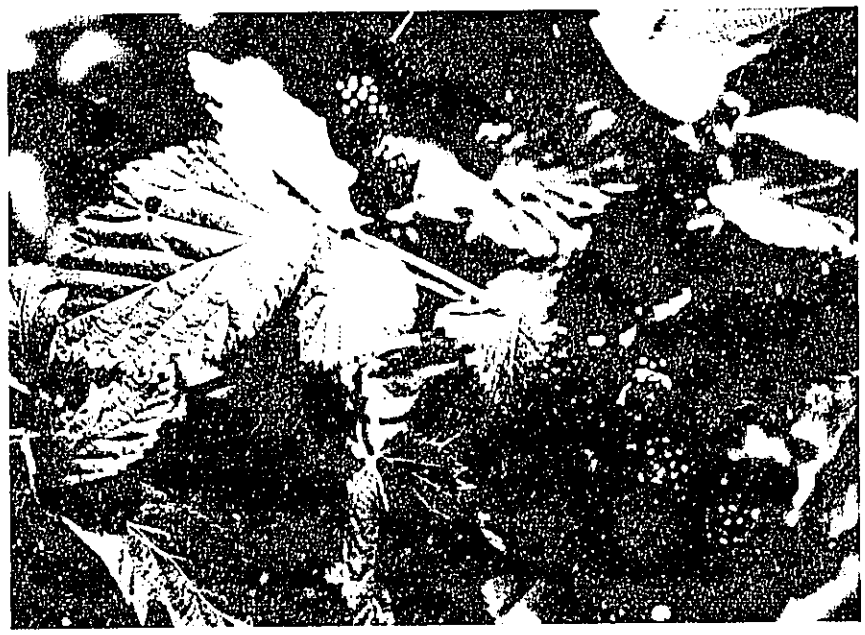
The Habitat Trail was built by the YCC in 1979. They added three rest stops (unobtrusive benches) and repaired a bridge in 1980. Because of restricted funding, it remains the only interpretive facility on the refuge. It must still be closed during goose season because two refuge blinds are located nearby. The trail was walked by 1200 people in 1981.

6. Interpretive Exhibits/Demonstrations

Three scripts, numerous slides, and one exhibit were transferred to the Area Manager, Missouri Department of Conservation (MDC) for use at their Swan Lake Hunting Headquarters during goose season. The FWS assumed some responsibility for hunter education at that facility after borrowing AV equipment from the Denver Regional Office in 1978.

Scripts transferred: Eagle Presentation, 3-1/2 min. 21+ slides; Steel Shot, 6 min. 25 slides; Trapping/Banding Series, 2 min. 10 sec. 6 slides. The exhibit was used during a one-day banding seminar in January 1980 and is based upon seven excellent black and white photos made from old negatives with interpretive text describing the history and development of the Dill-Thornsberry Cannon net trap at the refuge.

Our Eagle Presentation was used almost verbatium during the 1981-82 season along with a Missouri Department of Conservation developed steel shot presentation.



#12 - Best raspberries in years! 81-81b/1210 ERM

#13 - Plums were in abundance 81-81b/1212 ERM

7. Other Interpretive Programs

The third annual Eagle Days attracted a record number of visitors during the weekend of January 17-18. An estimated 1150 people attended this FWS/MDC event. The National Wildlife Federation film "We Can Save The Eagle" was shown and Paul Price of the Dikerson Park Zoo, in Springfield, Missouri, gave his slide talk presentation on captive eagle breeding and displayed Omega, a "fist-trained" bald eagle.

The outdoor portion of Eagle Days consisted of caravans through the refuge to various viewing points staffed by MDC naturalists with spotting scopes. There were approximately 80 eagles on the refuge during the weekend.

Besides Eagle Days, the only "other interpretive program" we offered in 1981 was guided bus tours to school groups. Of the 18 tours given during the year 13 of them were given in October. All teachers were advised that this may have been the last year that guided tours would be offered due to budget restrictions and cutbacks. They understood. A total of 770 students received a guided tour of the refuge.

8. Hunting

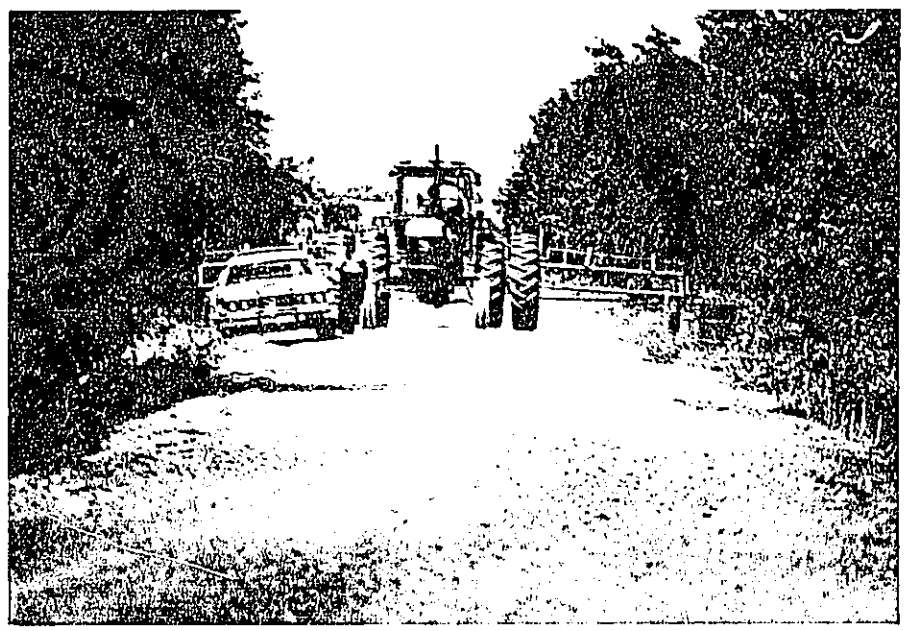
Goose - The Missouri Department of Conservation has administered goose hunting on the refuge since 1955. Approximately 2500 acres on the inside perimeter of the refuge are available to hunters. This year, heavy construction and flooding affected as many as 21 of the 60 available blinds. Prior to the season, five portable blinds were added on the northern perimeter to help meet anticipated demand.

The season began October 31 and ended January 8, 1982. A total of 8665 refuge hunters harvested 3584 Canada geese, 67 snow geese, and 7 white-fronted geese. The zone quota of 20,000 birds was not attained for the sixth consecutive time. By the end of the 70-day season, only 16,587 Canada geese had been harvested. Hunter success on the refuge averaged .41; off-refuge hunters averaged .33.

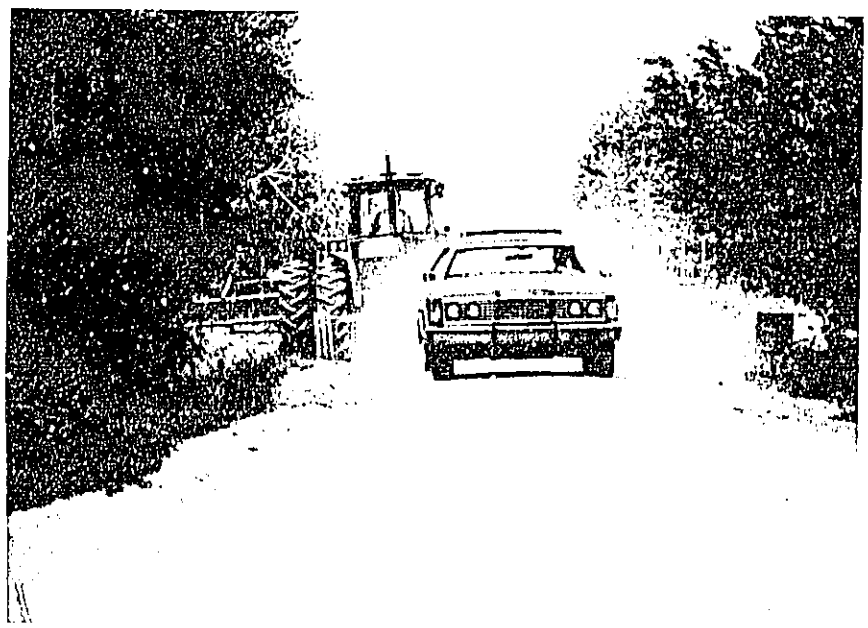
Deer - For the second year the refuge had an Historic Weapons hunt for white-tailed deer. It too was administered by the Missouri Department of Conservation. Muzzleloaders, long and compound bows, and crossbows were allowed. This year's hunt ran from October 10 through the 12th. Approximately 3500 acres were open for hunting and heavy cover made it difficult. A total of 149 hunters harvested only 20 bucks and 13 does.

9. Fishing

Warm water fishing attracted 15,764 people, or about 20% of our total visitation. Fishing is permitted from March 1-September 30, daylight hours only and in accordance with State and Federal regulations. The quality of refuge fisheries continues to decline because of siltation.



#10 - Swan Lake traffic jams.... 81-F3d/1196 ERM



#11 - ...require tactful handling; 81-F3d/1197 ERM

11. Wildlife Observation

Wildlife observation and photography accounted for roughly two-thirds of our 78,000 visitors in 1981. About half of the non-consumptive recreation occurs in October and November during the height of fall waterfowl migration.

12. Other Wildlife Oriented Recreation

Some wildlife oriented camping is allowed on the refuge immediately west of the State Hunting Headquarters (MDC). We do not consider this a part of refuge operations and it has never been reported under refuge outputs.

17. Law Enforcement

The refuge has four people who have been through FLETC and our enforcement profile is higher now than in years. However, the majority of cases are still made during waterfowl season. During the 1981 season, 49 citations were processed through Federal or State court and there were an additional 10 formal warnings.

Listed below are the citations, fine, and cost:

Citation	Federal	State	Fine	Cost
Possessing lead shot on refuge	8		$400.	
" " " " "		4	40.	$92.
Improperly plugged gun	5		160.	
" " "		1	10.	22.
Trespass on refuge	10		250.	
" " "		2	21.	45.
Unplugged gun	4		160.	
" "		1	40.	23.
Motor vehicle in non-designated area	3		75.	
Loaning Federal waterfowl stamp		2	100.	46.
Using Federal waterfowl stamp belonging to another		2	100.	46.
Shooting over 10 shells		2	20.	46.
Non-reident hunting on resident permit		2	80.	47.
Altered permit		1	29.	23.
Hunting w/o Federal waterfowl stamp		1	50.	23.
Loaning hunt permit & State water.stamp		1	suspended	

I. EQUIPMENT AND FACILITIES

1. New Construction

The Administrative Office/Visitor Contact Station was completed this year. The final inspection was made in February and we moved in shortly thereafter. The 3200 square foot building was funded by BLHP at a cost of

#14 - Office/Visitor Contact Station during construction — 81-DI/1198 JDK

#15 - Office/visitor Contact Station after construction — 81-DI/1199 ERH

$302,918. The quality of workmanship was extremely good. The building has one major flaw; it was designed for solar energy but there was not enough money available to equip the building with solar. So, we are stuck with $650. a month electric bills.

2. Rehabilitation

A considerable amount of levee and water control structure rehab occurred this year. A BLHP contract for $220,000 was let to clear brush off of and riprap one mile of Levee 1. Another BLHP project was let to rehab four water control structures and riprap 2200 feet of levee. Cost of this project was $374,450.

Work continues on the rehab of Dike A. This cropland protection levee was constructed in 1980, under BLHP. In 1981, it was breached in four places by floods. The original contract was renegoiated and the dike is being constructed a foot higher and two feet wider than the initial specifications.

3. Major Maintenance

The shop and the YCC building were reroofed this year.

4. Equipment Utilization and Replacement

Our vehicles and heavy equipment are excellent as they were purchased under BLHP in 1980. We did acquire, via surplus, a D-4 Cat dozer and a rubber tired frontend loader. A levee plow was purchased to terrace our moist soil units.

6. Energy Conservation

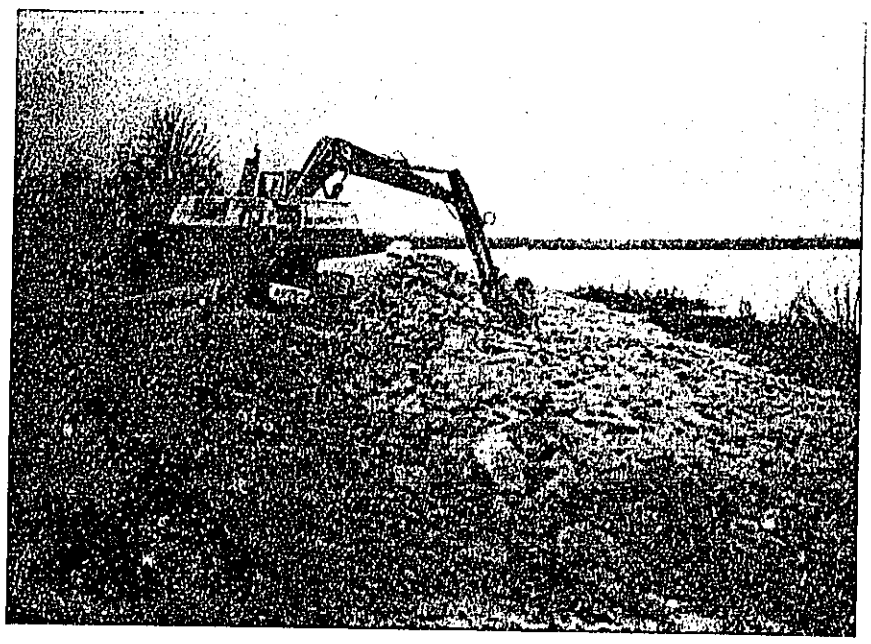
An insert was installed in the fireplace at Quarters 13 to help heat the house. Also the floor and the hot water pipes were insulated.

Normal energy conservation measures have been implemented such as turning off the hot water heater in the office, lowering the temperature in the buildings in the winter, reducing the number of lights, and insulating pipes.

J. OTHER ITEMS

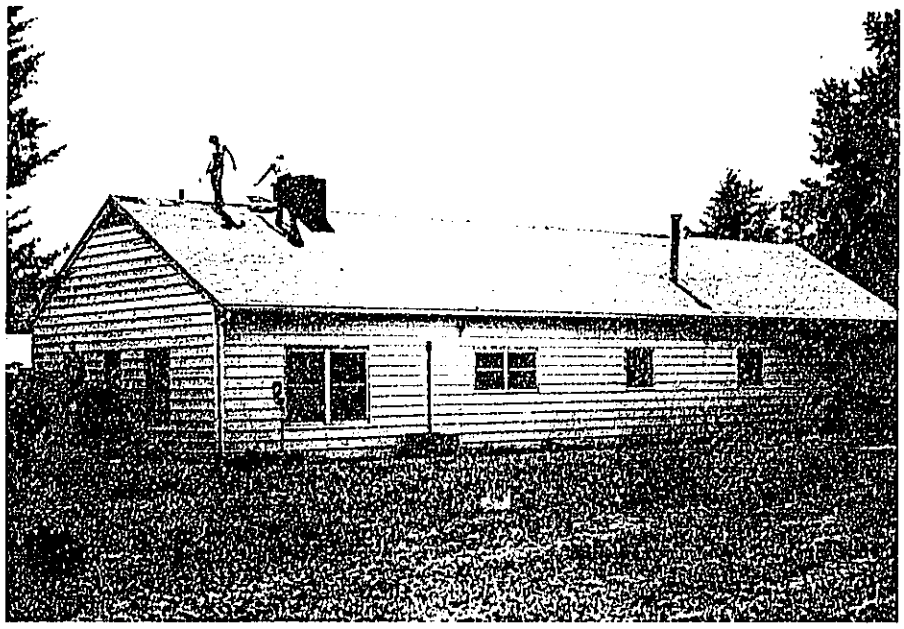
1. Cooperative Programs

The U.S. Department of Agriculture, Soil Conservation Service, issued a contract in 1979 to AESCO Oceanographic of Arlington, Virginia, to survey Swan, South, and Silver Lakes, and three pools at Fountain Grove WMA (MDC). Amounts of accumulated sediment were measured, sedimentation rates computed, and the life of all reservoirs was projected.

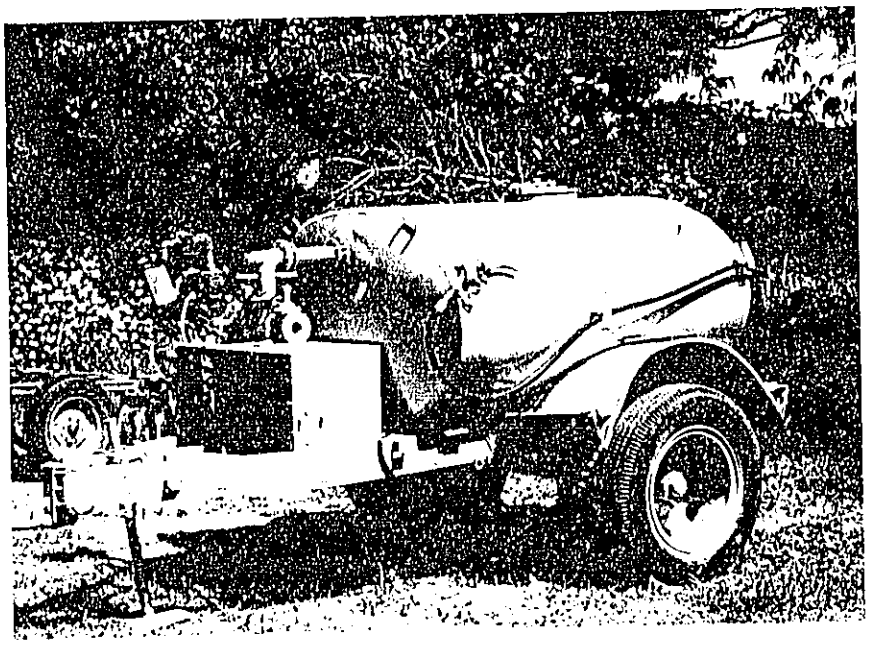


#16 - Riprap placement 81-DI/1206 ERM

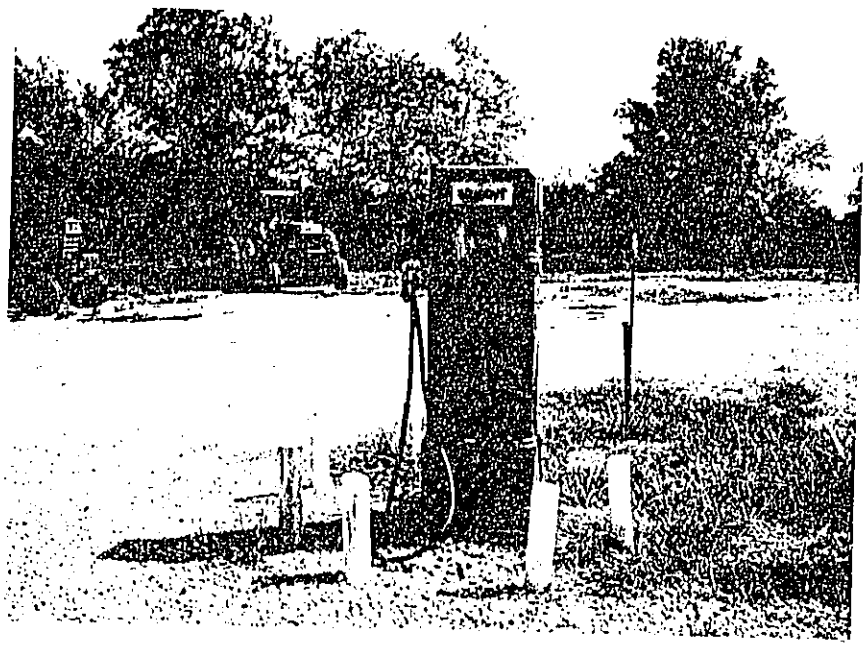
#17 - Completed riprap job 81-DI/1207 ERM



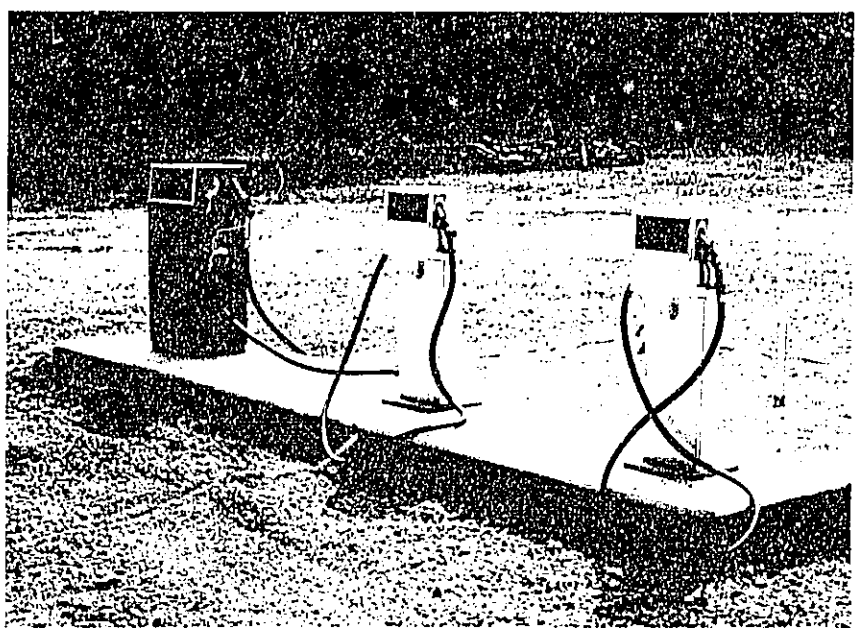
#20 - Reroofing shop 81-05/1200 ERM



#21 - Portable diesel tank repainted 81-03/0201 JBK



#18 - Old diesel pump 81-D2/1202 JDK



#19 - New diesel and gasoline pumps 81-D2/1203 ERH

If the willows don't choke them to death this year or next, the study indicates that Swan, South, and Silver Lakes will be with us for 178, 181,and 282 years, respectively.

The Fish and Wildlife Service and the Missouri Department of Conservation continued a waterfowl mortality study on the refuge to determine predator scavenging rates on carcasses, causes of mortality, and mortality rates. This study should be completed in the spring of 1982.

2. Items of Interest

Refuge Manager Al Manke retired on January 9, after 34 years of Federal service. Three days later, he and Refuge Assistant Janis Turner married.

The new Office Visitor/Contact Station building was occupied on February 18.

Jack Toll became our new refuge manager on June 6.

In the last week of July, 85% of the refuge flooded.

Janet Wright hired under YACC program in August.

Refuge Assistant Manke (nee Turner) completed 20 years of Federal service on September 21. Assistant Area Manager Don Young presented Janis her 20-year pin on the 24th.

Kenny Foster hired under YACC program in October. Kenny worked here before as a YCC enrollee in 1978.

Refuge flooded from November 2-7, closing 21 goose blinds for five days.

Peak population of 82 wintering bald eagles counted on December 21.

3. Credits

Sections A, D, E, F, G, and I - Assistant Refuge Manager Kuykendall
Sections B, H, and J - Outdoor Recreation Planner Moyer
Section K - Refuge Manager Toll
Typing - Refuge Assistant Manke

K. FEEDBACK

Our new Office/Visitor Contact Station is attractive and certainly needed. However, we have an interpretive room with nothing in it and a roof designed for solar heating without any panels. Our greatest concern is the high fixed cost of heating and cooling the building. The panels to convert to solar would cost $50,000. Not a cost effective expenditure.

Since we have many buildings designed for, but not fitted with solar, would it not be worthwhile to look into cheaper ways of taking advantage of the solar design? Possible units purchased outright and installed by refuge personnel or local workers? Or, volume purchases of universal units that could be used on many different buildings? Or, plans for kits we could build ourselves? Come on thinkers, we need help!